



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,477	03/31/2004	Shaomin Samuel Mo	MATI-240US	7778
23122	7590	08/14/2007		
RATNERPRESTIA			EXAMINER	
P O BOX 980			BAYARD, EMMANUEL	
VALLEY FORGE, PA 19482-0980			ART UNIT	PAPER NUMBER
			2611	
			MAIL DATE	DELIVERY MODE
			08/14/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/814,477

Applicant(s)

MO ET AL.

Examiner

Emmanuel Bayard

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 and 26-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 26-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 5 is objected to because of the following informalities: in line 4 after "seeds" a period ---. --- is required. Appropriate correction is required.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 28-29 are rejected under 35 U.S.C. 101 because descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

Both types of "descriptive material" are nonstatutory when claimed as descriptive material per se. Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be

Art Unit: 2611

realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and *Warmerdam*, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored in a computer-readable medium, in a computer, on an electromagnetic carrier signal does not make it statutory. See *Diehr*, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in *Benson* were unpatentable as abstract ideas because “[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer.”). Such a result would exalt form over substance. In *re Sarkar*, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978) (“[E]ach invention must be evaluated as claimed; yet semantogenic considerations preclude a determination based solely on words appearing in the claims. In the final analysis under § 101, the claimed invention, as a whole, must be evaluated for what it is.”) (quoted with approval in *Abele*, 684 F.2d at 907, 214 USPQ at 687). See also *In re Johnson*, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978) (“form of the claim is often an exercise in drafting”). Thus, nonstatutory music is not a computer component and it does not become statutory by

Art Unit: 2611

merely recording it on a compact disk. Protection for this type of work is provided under the copyright law.

When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory and should be rejected under 35 U.S.C. § 101. In addition, the examiner should inquire whether there should be a rejection under 35 U.S.C. § 102 or 103. The examiner should determine whether the claimed nonfunctional descriptive material be given

patentable weight. The USPTO must consider all claim limitations when determining patentability of an invention over the prior art. In re Gulack, 703 F.2d 1381, 1385, 217 USPQ 401, 403-04 (Fed. Cir. 1983). The USPTO may not disregard claim limitations comprised of printed matter. See Gulack, 703 F.2d at 1384, 217 USPQ at 403; see also Diehr, 450 U.S. at 191, 209 USPQ at 10. However, the examiner need not give patentable weight to printed matter absent a new and unobvious functional relationship between the printed matter and the substrate. See In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994); In re Ngai, 367 F.3d 1336, 70 USPQ2d 1862 (Fed. Cir. 2004).

(a) Functional Descriptive Material: "Data Structures" Representing

Descriptive Material Per Se or Computer Programs Representing Computer

Listings Per Se

Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer. See, e.g., Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760

(claim to a data structure per se held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory.

Similarly, computer programs claimed as computer listings per se, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See *Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions.

Computer programs are often recited as part of a claim. USPTO personnel should determine whether the computer program is being claimed as part of an otherwise statutory manufacture or machine. In such a case, the claim remains statutory irrespective

Art Unit: 2611

of the fact that a computer program is included in the claim. The same result occurs when a computer program is used in a computerized process where the computer executes the instructions set forth in the computer program. Only when the claimed invention taken as a whole is directed to a mere program listing, i.e., to only its description or expression, is it descriptive material per se and hence nonstatutory. Since a computer program is merely a set of instructions capable of being executed by a computer, the computer program itself is not a process and USPTO personnel

should treat a claim for a computer program, without the computer-readable medium needed to realize the computer program's functionality, as nonstatutory functional descriptive material. When a computer program is claimed in a process where the computer is executing the computer program's instructions, USPTO personnel should treat the claim as a process claim. See paragraph IV.B.2(b), below. When a computer program is recited in conjunction with a physical structure, such as a computer memory, USPTO personnel should treat the claim as a product claim. See paragraph IV.B.2(a), below.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under

Art Unit: 2611

the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3, 6-8, 26 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Hiramatsu et al U.S. Pub No 20030147358 A1.

As per claims 1, 26 and 28 Hiramatsu et al teaches a method for processing source data for transmission over a wideband signal such that the wideband signal has reduced discrete power spectral density (PSD) components, the wideband signal including wideband signal pulses, the method comprising the steps of: generating data symbols responsive to the source data (see figs. 4, 6 and page 3 [0041]-[0045]); transforming one or more of the data symbols into a frame including one or more orthogonal frequency division multiplexing (OFDM) symbols (see fig.6 element 607); a multiplexing section is the same as the claimed (selectively inverting) (see page 3 [0050-0055]). (Note that in page 8, paragraph 1 of the current application, the inverter 112 is described as a multiplexer therefore the multiplexer of Hiramatsu is functionally equivalent the inverter) the frame of OFDM symbols responsive to a spreading section is the same as the claimed (random data sequence). Note that spreading section is well known in the art to generate random sequence or PN sequence or pseudo random sequence therefore the spreading section of Hiramatsu is equivalent to the claimed random sequence); and up converting the CDMA signal is the same as the claimed (modulating) the wideband (see abstract and fig.6 element 611 and page 3 [0056]. Note that in CDMA data is transmitted using wideband frequency spectrum therefore the wideband signal is inherently taught by Hiramatsu) signal pulses of the wideband signal with the selectively inverted frame of OFDM symbols.

As per claim 3, Hiramatsu teaches wherein the data symbols are in a frequency domain and wherein the transforming step comprises the step of: transforming the one or more data symbols from the frequency domain to a time domain to produce the frame including the OFDM symbols (see page 3 [0054]).

As per claim 6, Hiramatsu teaches wherein the selectively inverting step comprises the steps of:); a multiplexing section is the same as the claimed (selectively inverting) (see page 3 [0050-0055]). (Note that in page 8, paragraph 1 of the current application, the inverter 112 is described as a multiplexer therefore the multiplexer of Hiramatsu is functionally equivalent the inverter) one or more individual OFDM symbols within the frame responsive to the random data sequence.

As per claims 7 and 8, Hiramatsu inherently teaches up converting the CDMA signal is the same as the claimed (modulating) the wideband (see abstract and fig.6 element 611 and page 3 [0056]. Note that in CDMA data is transmitted using wideband frequency spectrum therefore the wideband signal is inherently taught by Hiramatsu) wherein the wideband signal is an ultra wideband signal including ultra wideband signal pulses and wherein the modulating step comprises the step of: up converting the CDMA signal is the same as the claimed (modulating) the wideband (see abstract and fig.6 element 611 and page 3 [0056]. Note that in CDMA data is transmitted using wideband frequency spectrum therefore the wideband signal is inherently taught by Hiramatsu) modulating the ultra wideband signal pulses of the ultra wideband signal with the selectively inverted frame of OFDM symbols.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 4, 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al U.S. Pub No 20030147358 A1 in view of Batra et al U.S. Pub No 2005/0190817 A1.

As per claim 2, Hiramatsu teaches all the features of the claimed invention except wherein the source data includes bits and the generating step comprises the step of: mapping bits of the source data to the data symbols using one of (i) binary phase shift keying and (ii) quadrature phase shift keying.

Batra teaches mapping bits (see fig.5 element 512 and page 3 [0029]) of the source data to the data symbols using one of (i) binary phase shift keying and (ii) quadrature phase shift keying.

It would have been obvious to one of ordinary skill in the art to implement the teaching of Batra into Hiramatsu as to map the data symbols onto a unique frequency tone as taught by Batra (see page 3 [0029]).

As per claims 4, 27 and 29, Hiramatsu teaches all the features of the claimed invention except further comprising the step of: scrambling the source data prior to the generating step.

Art Unit: 2611

Batra teaches scrambling the source data prior to the generating step (see fig.5 element 504 and page 3 [0029]).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Batra into Hiramatsu as to secure the data input and facilitate error detection and correction in the receiver as taught by Batra (see page 3 [0029]).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 9-10 and 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al U.S. patent No 2005/0190817 A1 in view of Gerakoulis et al U.S. Pub No 2005,0013240 A1.

As per claim 9, Hiramatsu et al teaches an apparatus for processing source data for transmission over a wideband signal such that the wideband signal has reduced discrete power spectral density (PSD) components; the wideband signal including wideband signal pulses (see abstract), the apparatus comprising: a mapper configured to generate data symbols responsive to the source data (see fig.5 element 512 and page 3 [0029]); a transformer coupled to the mapper, the transformer configured to transform one or more data symbols

Art Unit: 2611

into a frame including one or more orthogonal frequency division multiplexing (OFDM) symbols (see fig.5 element 514 and page 3 [0029]).

However Batra does not teach an inverter coupled to the transformer, the inverter configured to selectively invert the frame of OFDM symbols; and a wideband transmitter coupled to the inverter, the wideband transmitter configured to modulate the wideband signal pulses of the wideband signal with the selectively inverted frame of OFDM symbols.

Gerakoulis et al an inverter coupled to the transformer, the inverter configured to selectively invert the frame of OFDM symbols (see figs. 1, 6 and 9 element 30 and page 2 [0033]-[0035]); and a CDMA transmitter coupled to the inverter, the wideband transmitter configured to modulate (see figs. 1, 3, 9 element 40 and page 2 [0020]. Note that in CDMA data is transmitted using wideband frequency spectrum therefore the wideband signal is inherently taught by Gerakoulis et al) the wideband signal pulses of the wideband signal with the selectively inverted frame of OFDM symbols.

It would have been obvious to one of ordinary skill in the art to implement the teaching of Gerakoulis et al into Batra as to generate orthogonal codes to desired lengths as taught by Gerakoulis et al (see page 1 [0006]).

As per claim 10, Batra does teach a scrambler coupled to the mapper, the scrambler configured to scramble the source data prior to mapping the source data to the data symbols (see fig.5).

As per claim 12, Batra does teach wherein the wideband transmitter is a multi-band wideband transmitter (see abstract).

Art Unit: 2611

As per claim 13, Batra does teach wherein the wideband transmitter is an ultra wideband transmitter (see abstract.

As per claim 14, Batra does teach wherein the data symbols are in a frequency domain and the transformer is configured to transform the data symbols from the frequency domain into the frame of OFDM symbols in a time domain (see abstract and fig.5 element 514).

As per claim 15, it is rejected under the same rational or criteria of claim 9 above wherein the inverter is configured to selectively invert one or more individual OFDM symbols within the frame.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu et al U.S. Pub No 20030147358 A1 in view of Batra et al U.S. Pub No 2005/0190817 A1 and in further view of Jones et al U.S. Pub No 2002/01869585 A1.

As per claim 5, Hiramatsu and Batra in combination teaches all the features of the claimed invention except scrambling the source using a linear feedback shift register schemed initialized using uncorrelated seed.

Jones teaches scrambling the source using a linear feedback shift register schemed initialized using uncorrelated seed (see fig.5 and page 7 [0097]).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Jones into Hiramatsu and Batra as to generate high-speed very high binary sequences which possess good autocorrelation properties that would be processed to closely approximate an impulse at a point of correlation as taught by Jones (see page 6 [0086]).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Batra et al U.S. patent No 2005/0190817 A1 in view of Gerakoulis et al U.S. Pub No 2005,0013240 A1 and in further view of Jones et al U.S. Pub No 2002/01869585 A1.

As per claim 5, Batra and Gerakoulis et al in combination teaches all the features of the claimed invention except scrambling the source using a linear feedback shift register schemed initialized using uncorrelated seed.

Art Unit: 2611

Jones teaches scrambling the source using a linear feedback shift register schemed initialized using uncorrelated seed (see fig.5 and page 7 [0097]).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Jones into Batra and Gerakoulis et al as to generate high-speed very high binary sequences which possess good autocorrelation properties that would be processed to closely approximate an impulse at a point of correlation as taught by Jones (see page 6 [0086]).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kadous et al U.S. patent No 7,184,713 B2 teaches a rate control for multi-channel. Walton et al U.S. patent No 7,095,709 B2 teaches diversity transmission.

Welborn et al U.S. Pub No 2005/0185669 A1 teaches a common signaling mode.

Walkouts U.S. Pub No 20010021182 A1 teaches a transmitter apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272 3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM) Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571 272 3042. The fax

Art Unit: 2611

phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

8/8/2007

Emmanuel Bayard
Primary Examiner
EMMANUEL BAYARD
PRIMARY EXAMINER